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Preparing Peaches for Market

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U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

PEACHES are grown commercially in many widely separated areas of the United States. Important producing areas are located in Southern, Middle Atlantic, Northeastern, North Central, Middle Western, Rocky Mountain, and far Western States. A large part of the commercial crop is shipped to distant markets.

As peaches are extremely perishable, very careful and rapid handling during the harvesting, grading, packing, and shipping operations is necessary to avoid unsatisfactory delivery in consuming markets.

Harvesting the fruit at the most suitable stage of development is of primary importance. Peaches picked too green or left on the tree too long may cause serious losses to growers, shippers, and receivers.

Costly damage from bruising is often caused by improper handling and shipping methods.

This bulletin describes methods now being used in preparing the peach crop for market in the principal production areas. The questionable quality and condition of many peaches offered to the consuming public indicate a need for continued improvement in handling methods, and for added effort by many growers and shippers toward delivery of fruit at destination markets in a more desirable stage of maturity.

Standard grades are used extensively by growers and shippers in preparing their peaches for market and by dealers as a basis for the purchase and sale of the fruit.

Washington, D. C.

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PREPARING PEACHES FOR MARKET

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IMPORTANCE OF LABOR SUPPLY

ONE of the most important factors in properly harvesting and preparing a peach crop for shipment is a sufficient and dependable labor supply. In some growing districts, adequate numbers of workers are available from neighborhood families or nearby towns, but in most large producing areas the employment of transient laborers is both necessary and desirable. Many migratory workers make the harvesting and packing of various fruit and vegetable crops their principal means of livelihood. They move from State to State and from product to product as the crops reach the harvesting season. Such professional migratory workers may prove more experienced and capable than laborers obtainable from local sources. Where only inexperienced transients are available, dependable local people are employed for operations such as grading and packing which require a considerable degree of experience and skill.

HARVESTING

The condition of peaches at the time of their arrival in consuming markets is greatly influenced by the stage of maturity at which they are picked and by the care and speed with which they are handled. Serious losses are often sustained by growers and dealers as a result of shipping immature or overripe fruit. For this reason it is particularly important that every effort be made to pick the peaches at just the right time.

Almost equally important is preventing damage to the fruit by rough handling or by allowing picked fruit to stand too long in the

¹ Acknowledgment is made of the assistance rendered by the field representatives of the Fruit and Vegetable Branch, PMA, who supplied much of the specific information relating to various producing areas for use in this bulletin. J. W. Park was the author of the original edition.

orchard. At temperatures prevalent at harvesttime, delay in handling peaches promptly from the orchard to the packing house is especially detrimental.

Time of Picking

Peaches should reach the market at a stage of maturity as advanced as the subsequent handling through the ordinary trade channels will permit. The degree of maturity at which fruit should be picked to most nearly approach this desired condition depends on the variety, the weather conditions, the care with which the fruit is handled, the facilities for proper refrigeration, and the time involved between picking and the delivery of the fruit at the market.

Peaches to be shipped long distance should be picked when they are mature, but firm enough to reach the final consumer slightly before the fully ripe stage. Those that are intended for immediate truck shipment to nearby markets may be allowed to attain a considerably more advanced stage of maturity before picking.

The maturity of peaches is influenced by a number of factors, including temperature and moisture during the growing and ripening periods, amount of foliage and vigor of trees, and the kinds and amounts of fertilizer used. In determining whether or not a peach is mature, consideration should be given to various indications of maturity.

Ground color is often the most important indication, and usually changes as the peach becomes mature, from the green that indicates immaturity, to a greenish yellow in the case of yellow-fleshed varieties, or to a greenish cream or creamy white color in the case of white-fleshed varieties. Under some unusual growing conditions or when large amounts of nitrogen fertilizer have been applied to orchards, the ground color of many peaches may indicate immaturity, but an examination of the flesh will show that they are mature.

The flesh of an immature peach has a fine, granular appearance which disappears as the peach becomes mature. This fine, granular appearance of the flesh of an immature peach can be observed when the flesh is broken but not when it is cut. Such a test is most easily made by partially cutting the flesh and breaking it the rest of the way.

Peaches of the Elberta and similar varieties that do not have the shoulders and sutures filled out are often immature. This indication is less reliable in dry seasons when the sutures of mature peaches may not develop normally.

Halves of mature freestone peaches of most varieties will usually come free from the pit without leaving adhering flesh, when the peach is cut to the pit and twisted in the hands. This test may not always be reliable, since in dry seasons, immature peaches may react in the same way as mature peaches.

The flesh of a mature peach is sweet and palatable in taste, while that of an immature peach is starchy and unpalatable. The blush or red color is not a reliable indicator of maturity, although it may well be considered in conjunction with the other factors used in determining maturity.

A pressure tester is sometimes used as a general guide in determining correct picking maturity.²

² See Farmers' Bulletin 2021, "Peach Growing East of the Rocky Mountains."

Any picking schedule is naturally dependent on weather conditions. Peaches ripen rapidly in hot weather and are retarded in ripening by cool weather. The stage of development at which peaches should be picked differs somewhat with the variety, as some varieties deteriorate very quickly after reaching maturity and others more slowly. Some ripen unevenly and others have a tendency to drop as they reach maturity. For example, the Hiley, an important variety in the South, ripens more slowly than most other medium-early varieties and may be left on the tree longer than others after it shows indications of maturity. Elberta, the most popular and widely grown commercial variety, and one of the best varieties for long-distance shipment, usually must be picked promptly after reaching a certain stage, to avoid loss from dropping.

Peaches are sometimes sent to market when they are so green that they shrivel instead of ripening. This not only defeats the effort to obtain the high prices paid for early shipments, but may cause very serious losses. Such individual losses are, however, only a small part of the injury to the industry as a whole, since the consumer's loss of confidence in the product may result in fewer and smaller purchases and consequently lower prices for all peaches for a considerable length of time.

If peaches are to be picked at the proper stage of maturity, the trees should be selectively picked over several times. Obviously, it is impossible to pick all peaches at exactly the same stage of maturity, but excessive variations in maturity lessen the desirability and value of the product. Uniformity in the maturity of peaches within each shipment depends largely upon the efficiency of field supervision and the number of selective pickings made. Many growers fail to realize the ultimate detrimental effect of any great degree of maturity variation within individual packages or within the shipment as a whole.

In several growing areas, under average conditions, three to six pickings are made, in other districts, two or three pickings. In a few locations, as many as seven or eight pickings are made of some varieties, the number depending on weather and other factors.

Care in Picking

Constant care must be used in picking peaches to prevent bruising. Damage to the fruit results from carelessness in dropping the peaches into picking containers or in pouring them from picking containers to the field boxes or baskets used for hauling the fruit to the packing house.

To prevent damage from bruising, as well as to facilitate the selection of mature fruit, adequate supervision of the picking operation cannot be too strongly recommended. New pickers need thorough instruction and should be given a demonstration of each step in the picking process. Even experienced pickers need suggestions for doing this work more easily and carefully. Each picker should be furnished the necessary equipment in good condition.

Peaches should be removed from the tree by pulling them outward and by giving the fruit a slight twist. Each peach should be placed, not dropped, in the picking container. When the picking container is emptied to field boxes or baskets, the fruit should be carefully

transferred, with as little rolling or dropping as possible, not rapidly dumped from some distance above the box or basket.

Badly bruised fruit is practically worthless for shipping, and even slight bruises detract greatly from the keeping quality as well as from the appearance of the peaches in consuming markets. Since bruises are difficult to detect at the time of sorting and packing, much injured fruit that is susceptible to rapid deterioration may be unintentionally included in the packed product.

Picking Containers

Drop-bottom buckets or drop-bottom bags carried by shoulder straps are used as picking containers in most growing areas (figs. 1 and 2). Ordinary metal buckets carried by hand are used in some districts (fig. 3). Metal buckets, carried in a frame with supporting shoulder straps, are being used in a few localities. The buckets are removed from the carrying frame when the fruit is transferred to field boxes. Hampers and baskets are used to a limited extent, par-



FIGURE 1.—A drop-bottom picking bucket is used by this picker.

SC 7676



FIGURE 2.—Drop-bottom picking bags are used in many orchards.

PMA 19403



PMA 19404

FIGURE 3.—Ordinary metal buckets are used as picking containers in some districts. The use of any hand-carried container necessitates picking with one hand if the fruit is carefully handled. A container on the ground is a constant temptation for the picker to drop or toss the fruit into it.

ticularly in some districts near markets where the picking container may also be used as the marketing container.

The drop-bottom containers and the metal buckets carried with shoulder straps allow pickers free use of both hands. If these containers are carefully used, both when being filled and when the fruit is being transferred to field containers, they appear to give reasonable satisfaction. Various growers, however, report that fruit in drop-bottom bags is often bruised against ladders or trees while the bags are being filled and carried.

Hauling From the Orchard

In most important producing districts, peaches are usually hauled from the orchard on trailers pulled by tractors or on low or narrow-bed trucks or pickups (figs. 4 and 5). Horse- or mule-drawn wagons or sleds are still used by a few growers. In some districts, tree plantings are spaced to allow the use of ordinary trucks of conventional types (fig. 6). Many growers do not attempt to load more than one layer of containers when hauling from the orchard, whereas others stack containers in two or more layers with as much care as possible. Stacked loads are generally used if the fruit must be hauled a considerable distance.

Sound field boxes or baskets, not completely filled, can be so stacked as to minimize bruising the fruit in hauling, but too often careless laborers allow containers in upper layers to rest on fruit in lower layers without concern for the resulting damage. Peaches are often transferred from trailers, narrow-bed trucks, wagons, or sleds to regular-type trucks for delivery to the packing house when more than short-distance hauling is involved.

Sufficient equipment should be available to eliminate delay and to allow for careful handling in hauling fruit from the orchard. Regular deliveries should be made at the packing house, in order that employees there will not be alternately idle and rushed. A packing house crew waiting for peaches to arrive from the orchard can be a very costly matter. Capable supervision of orchard hauling is especially necessary if a large production is being handled.



FIGURE 4.—Hauling peaches from the orchard with a trailer.

PMA 19405



PMA 1940

FIGURE 5.—A narrow-bed truck used to haul peaches from the orchard.



PMA 19407

FIGURE 6.—Direct orchard loading of conventional-type fruit truck. Note careful stacking of lugs to prevent damage to the fruit.

PACKING HOUSES

Packing houses differ in type, location, and construction in the different peach-producing areas and within any one area. In many important shipping districts, the trend in recent years has been toward comparatively large, well-arranged, fully equipped central packing houses owned and operated by grower groups, shipping organizations, or individuals with large orchards. Such facilities are usually located in or near small towns where both rail and truck shipment can be utilized, and where employees are most readily available. However, in many other large producing areas, most packing houses are located on individual farms and are operated by the orchard owner (fig. 7).



FIGURE 7.—A typical South Carolina farm packing house.

PMA 1940

Many of these farm packing houses are well constructed, with floors built at truck-bed height, and are equipped with modern machinery and conveyors. Some packing houses are of inexpensive construction, often without floors, and they frequently lack the space, arrangement, and equipment to assure a fully satisfactory packing operation.

Packing can be most efficiently done in a fully equipped, well-arranged packing house having floors at the level of truck beds or railroad-car floors and sufficient space for all operations, as well as additional space for the storage of containers and other supplies. The expenditure that may be justified by any individual grower in acquiring such facilities is largely dependent on the size of the crop to be handled, the method of marketing the fruit, and various other factors. Growers who have small volumes of production or who have nearby market outlets, where fruit may be sold without specialized preparations, are not justified in making large expenditures for packing facilities.

Proper light is highly desirable for a packing house. The best possible lighting is particularly important for the grading operation. Grading is generally done under especially arranged artificial lights, even during daylight hours (fig. 8).

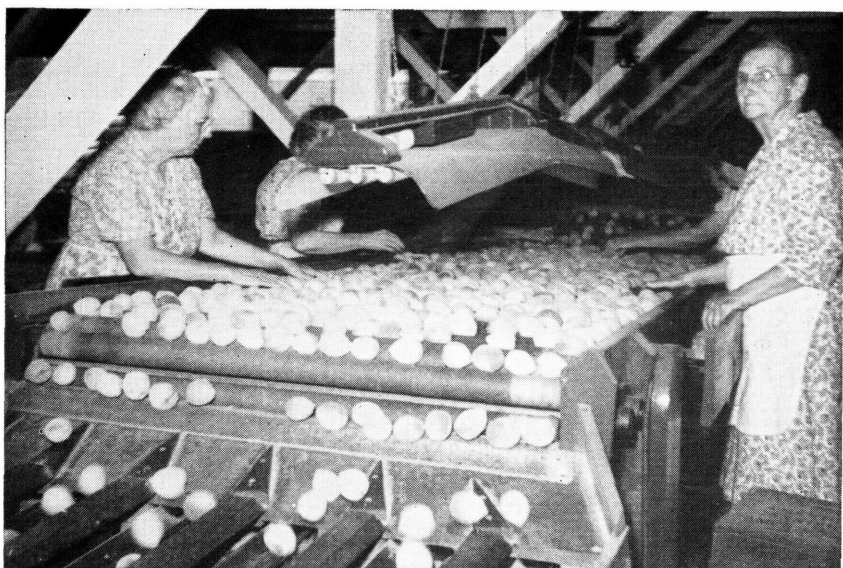


FIGURE 8.—Special lighting arrangement for the grading unit.

PMA 1940

PACKING EQUIPMENT AND PROCEDURE

From field boxes or baskets, peaches are transferred to conveyors which carry them through the necessary cleaning and sorting procedures prior to packing. In some packing houses, the fruit from the field containers first passes over rollers so spaced as to allow peaches which are smaller than the minimum packing size to fall between the rollers and thus be immediately eliminated from subsequent operations. Other preliminary sorting is frequently done before the peaches reach the defuzzing brushes. To preclude the probable spread of decay, it is particularly important that peaches showing any decay be removed prior to brushing. Such presorting, to remove decayed or soft peaches, or others which obviously should not be included in the pack, is occasionally done on a long belt conveyor on which the fruit may be placed at any point. This arrangement makes it unnecessary to move the peaches in field containers to a specific location for transfer to the conveyor.

Cleaning or Defuzzing Machines

Cleaning machinery for removing fuzz from peaches is now used extensively in all major production areas. In the defuzzing operation, the peaches pass between upper and lower sets of rotating brushes, or between rotating and stationary brushes, or over rotating brushes and under rotating rag wipers. The loosened fuzz is drawn away by an exhaust fan. Removing the fuzz greatly improves the appearance of the fruit and facilitates grading. During the brushing operation, sulfur dust is frequently applied to the peaches for the control of decay.

Grading

After passing through the defuzzing process, the peaches move on roller- or belt-type conveyors past the graders who pick off cull or undergrade peaches before the fruit reaches the sizing apparatus (fig. 9). The most popular type of conveyor for the grading or sorting operation consists of rollers placed close together and at right angles to the direction in which the conveyor moves. These rollers rotate as they move along and turn the peaches slowly so that graders can see the entire surface of each peach and readily remove defective specimens (fig. 10).

Machines are equipped with cull chutes or specially arranged conveyor belts to carry away the inferior fruit. These are so placed that sorters need not look away from the unsorted fruit that is passing on the main conveyor.

Proper grading is the most important and exacting nonmechanized operation performed in the packing house. Peaches for commercial shipment are most frequently graded to meet the requirements of the U. S. No. 1 grade. To efficiently sort fruit for this one grade only, the graders must recognize and remove peaches which are damaged by bruises, dirt, disease, insects, hail injury, leaf or limb rubs, and split pits, as well as those which show decay, growth cracks, unhealed cuts, worms, and worm holes. They should also remove peaches which are immature, soft, overripe, or misshapen. Because this work requires specialized knowledge and alertness, graders should be stationed along the grading unit according to their proficiency in the work, with the most experienced and dependable members of the crew giving the fruit the final inspection. Constant supervision of the grading operation is necessary to insure a uniformly graded pack.



FIGURE 9.—Grading peaches on a belt-type conveyor.

PMA 19410

The number of graders necessary depends on the capacity of the machinery being used, the quality and condition of the fruit, the grades being packed, and the competence of the graders.

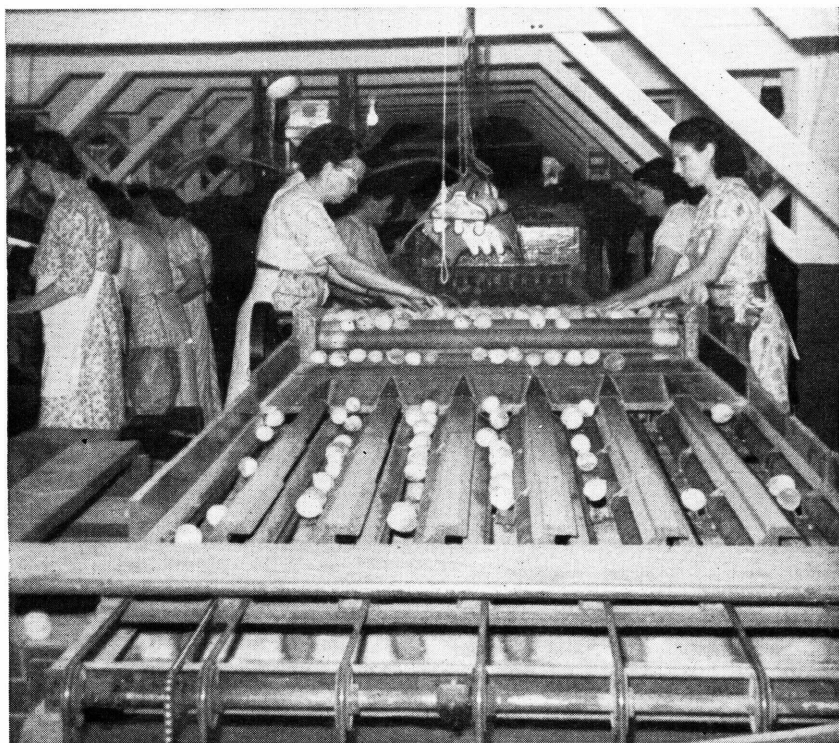


FIGURE 10.—Grading peaches on a roller-type conveyor.

PMA 19411

Sizing Machines

Sizing machines, especially designed for peaches, are considered a necessity when the fruit is sold according to stated diameters. Such machines are in general use in all important districts where peaches are packed in baskets. The larger packing houses frequently use two or more sizing machines. Even small packing houses operated by individual growers are commonly equipped with some type of sizing machinery.

Since the machines utilized in the various areas or in any one area are manufactured by several different companies, they vary somewhat in design and operation, but the sizing principle of practically all of the most commonly used machines is essentially the same. It consists of rotating rollers of progressively smaller diameter that operate parallel to a spring belt moving along a fixed guide. Rollers are constructed with offsets at intervals so that the smallest peaches fall between the largest section of roller and the belt, the next larger size falls after passing the first offset, and so on (fig. 11). On some machines, each offset is a separately adjustable roller section of smaller

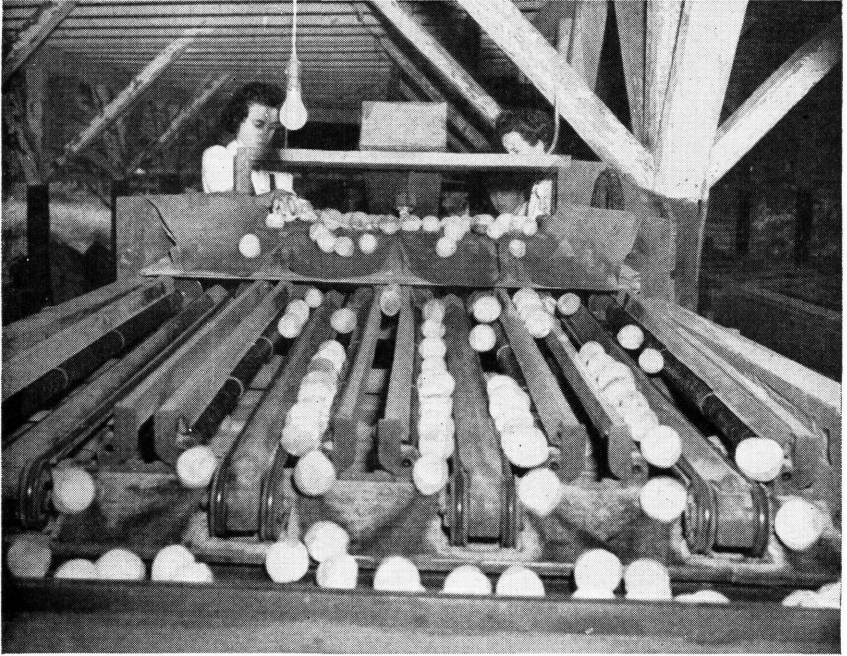


FIGURE 11.—Graduated roller-type sizing machine in operation.

diameter than the preceding section. In either case, the sizing operation is similar.

From the graders, the fruit moves on to the rotating sizing rollers which turn the peaches as the moving spring belts carry them along the rollers. The sizing units on many machines are sloped to utilize the aid of gravity in the movement of the fruit along the rollers. The peaches falling in each size group are transferred on separate conveyors to the proper bins for packing. Sizing machines are usually constructed with from two to eight rollers. The capacity claimed is approximately 60 bushels per hour for each roller lane. A few varied types of machines employing different sizing methods are used in some districts.

All of the later model machines are so constructed as to minimize bruising and cutting of the fruit. Sharp points, corners, and edges are eliminated or padded, and at points where peaches fall, hard surfaces are covered with sponge rubber. Peaches are often bruised, however, by overloading machines or in careless handling of fruit in transferring it from field containers to the conveyors.

When peaches are packed in western boxes or in Los Angeles or Sanger lugs, they may be machine-sized but are usually selected for size by the packers to conform to specific counts per box. Experienced packers have no difficulty in making reasonably accurate size selection with no delay in the packing operation. For this reason, sizing machines designed for peaches are not generally used in the Pacific Coast States. However, in Colorado and Utah where both baskets and boxes are packed, peaches are ordinarily machine-sized for packing in boxes as well as in baskets.

Packing Baskets

The most generally used method of packing baskets is that in which the top layer or face of the pack is first arranged in a rubber-lined concave metal facing form (fig. 12). A metal packing shell which will just fit inside the basket and which contains a thin cardboard liner, is then placed on the packed facing form and is filled by allowing peaches to run slowly from the sloping packing bin.



FIGURE 12.—Arranging peaches in facing forms.

N 6888

While being filled, the shell is rocked or shaken to settle the peaches and insure a tight pack. When the metal packing shell is filled, it is removed and the cardboard liner holds the pack in place. The inverted basket is fitted down over the pack, and is then turned to an upright position on a turning device which holds the facing form tightly in place as the basket is turned. The facing form is then removed and the cover, which is fitted with some type of a pad or cardboard lining, is attached.

The name of the variety and minimum diameter or minimum and maximum diameters of the contents are usually stamped on the cover. The grade also is usually stamped on the cover of baskets containing fruit which is packed to meet U. S. No. 1 grade or better. Labels, printed with a brand name and the name and address of the shipper, are frequently applied to baskets either before or after packing.

Packing Western Boxes

Peaches to be packed in western boxes are usually defuzzed in machines similar in operation to those used in areas where baskets are the principal shipping containers. From this cleaning process, the peaches move on slow belt conveyors in front of the sorters who remove off-grade fruit. As the conveyor moves past the packers they size the fruit "by eye" as they pack; or the conveyor may carry the unsized peaches to bins from which packers select for size. If sizing machines are used, the several sizes are carried by conveyors into separate packing bins.

Boxes are placed on small sloping benches beside the belts or bins. Packers wrap each peach before placing it in the box (fig. 13). The



PMA 19412

FIGURE 13.—Packing western boxes. Note wrappers at left of each packer.

wrappers are of thin paper but are strong enough that they do not tear easily. They are usually from 8 to 10 inches square, the size depending on the size of peaches to be wrapped, and they are often printed with a design or brand name.

Fruit is placed in the box so that the peaches in alternate rows are not directly opposite each other, but fit as far as possible into the space between the peaches in the next row. Peaches in the second layer are not placed directly over those in the first layer, but are "nested" between the tops of the lower layer peaches. This is called a diagonal pack because of its appearance (fig. 14).

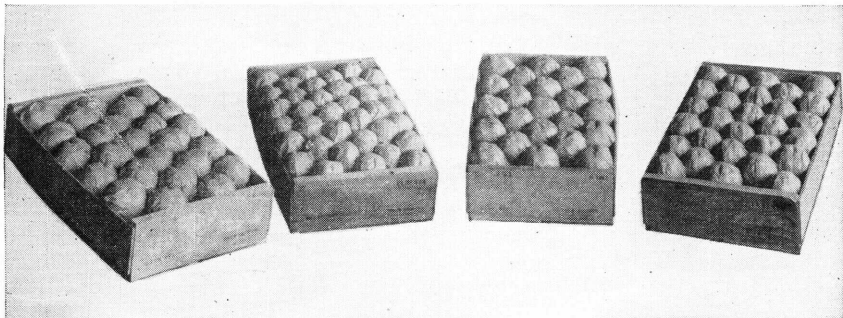


FIGURE 14.—Wrapped peaches in diagonal packs in western boxes.

PMA 7041

Table 1 shows the arrangement of peaches of various sizes in the box packs.

When packing is completed, the boxes move on a conveyor to the lidding machine or to a bench for hand lidding. Boxes are then stamped to designate the count, the name of the variety, and the name and address of the grower or shipper, unless the name and address are shown on a brand label. In some areas, the counts are marked on the boxes in multiples of five. Counts that vary from multiples of five are marked as the next lower multiple of five. A 96 count is

TABLE 1.—Arrangement and number of peaches packed in boxes

Peaches in adjacent rows		Layers in the box	Peaches in the box	Peaches in adjacent rows		Layers in the box	Peaches in the box
Cross-wise of the box	Length-wise of the box			Cross-wise of the box	Length-wise of the box		
Number	Number	Number	Number	Number	Number	Number	Number
3-3	8-8	2	96	2-3	6-6	2	60
3-3	8-7	2	90	2-3	6-5	2	55
3-3	7-7	2	84	2-3	5-5	2	50
3-3	7-6	2	78	2-3	5-4	2	45
2-3	8-7	2	75	2-3	4-4	2	40
3-3	6-6	2	72	2-2	4-5	2	36
2-3	7-7	2	70	2-3	4-3	2	35
2-3	7-6	2	65	2-2	4-4	2	32

marked as 95, 84 as 80, 78 as 75, 72 as 70, 36 as 35, and 32 as 30. If growers' or shippers' brand labels are used, a label is attached to one end of each box.

Methods of wrapping and packing, similar to those applying to western boxes, are used in packing peaches in both Los Angeles and Sanger lugs.

Packing Supervision

Competent and careful supervision is necessary in the successful operation of a peach-packing house. In some of the southern districts, professional managers are usually employed to operate the larger packing houses. These managers travel from one State to another and are experienced in the packing and handling of several commodities. In other districts, packing houses are generally supervised by experienced local employees. Packing houses located on individual farms are often supervised by the grower or a member of his family. It is important that every operation be performed as carefully as possible to eliminate damage by bruising the fruit. The grading operation should be repeatedly checked for accuracy, and the packing, lidding, and loading processes need close supervision to minimize handling damage.

PACKAGES

The most suitable package to be used in any producing section or by an individual in marketing peaches depends upon market preferences and condition, the relative cost of the packages, and the type of equipment and labor available. Tub-type bushel and half-bushel baskets, the western peach box, the Los Angeles lug, and the Sanger lug are the principal shipping containers now used in marketing the peach crop. Wire-bound boxes of approximately 1-bushel or $\frac{1}{2}$ -bushel capacity are being used to a limited extent in some areas, and various shippers are conducting experiments with other types of boxes.

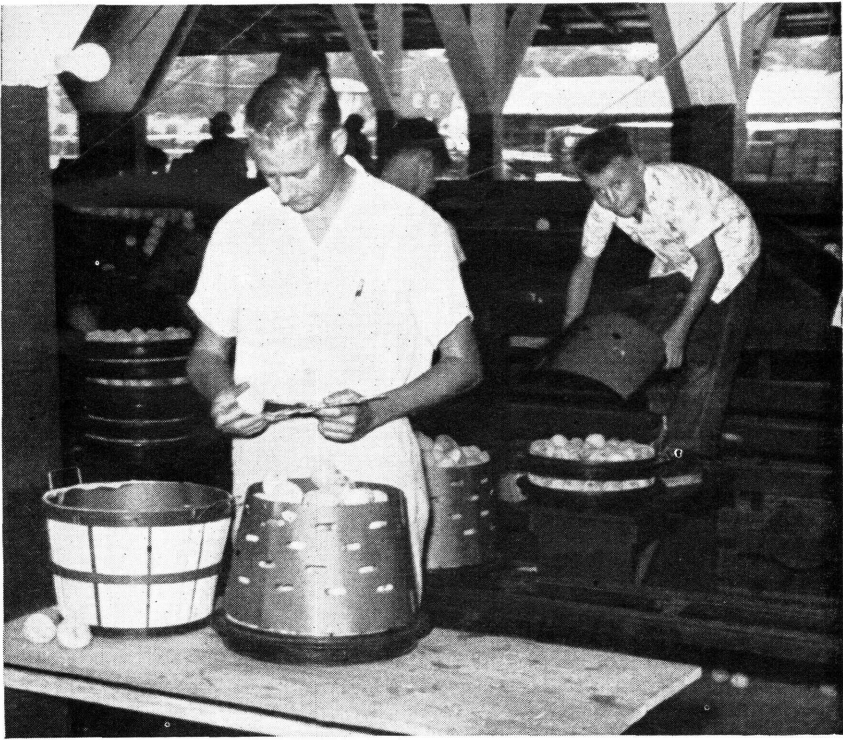
The tub-type (straight side) bushel basket continues to be, as it has been for many years, the most extensively used container for marketing peaches. It is the principal package used in all eastern, southern, north central, and middle western producing districts, as well as in the far western State of Idaho. In these areas, half-bushel baskets of the same type are also extensively used, particularly for early varieties. The half-bushel basket is also frequently used for later varieties when production is light and prices are relatively high. Approximately one-half of the peaches shipped from the Rocky Mountain States of Colorado and Utah are marketed in baskets, and the remainder is mostly packed in western peach boxes. The Los Angeles lug box also is occasionally used in these States.

Although baskets far exceed other packages in the volume used throughout the United States, they have many severe critics among receivers and shippers. Disadvantages frequently attributed to baskets, as long-distance shipping containers, include the lack of structural strength necessary to prevent buckling and racking as a result of extreme transit shock or pressure, the tendency of fruit in the faced and bulged top of the pack to be damaged by bruising or cutting, and the difficulty in arranging or bracing circular containers to prevent their rocking or shifting in transit.

Shippers in California, Washington, and Oregon most commonly market peaches in the western peach box, but the Los Angeles lug box and the Sanger lug box are also used, particularly for the larger sized fruit. The western box, which is always lidded, offers good protection to the peaches and makes an attractive display package. Its inside dimensions are: Width $11\frac{1}{2}$ inches; length $16\frac{1}{8}$ inches; and depth 4, $4\frac{1}{4}$, $4\frac{1}{2}$, $4\frac{3}{4}$, or 5 inches. Fruit is packed in two layers, and boxes of varying depths are used to accommodate different sized peaches. The boxes with $4\frac{1}{2}$ - and 5-inch depths are most commonly used. The approximate net weight of the fruit in these boxes, which may be packed with from 32 to 96 peaches, is 16 to 18 pounds. The Los Angeles lug box is $13\frac{1}{2}$ by $16\frac{1}{8}$ inches in width and length and $5\frac{3}{4}$ inches in depth, inside dimensions. It holds about 22 to 23 pounds net weight of fruit and is occasionally shipped unlidded. The Sanger lug, used to a considerable extent in California, has the same width and length as the Los Angeles lug but is $5\frac{1}{16}$ inches in depth.

INSPECTION

Many shippers in the important producing areas obtain Federal-State shipping point inspection of their peach shipments (fig. 15). The shipping point inspection service is operated under cooperative agreements between the United States Department of Agriculture



PMA 19413

FIGURE 15.—A Federal-State inspector examines a lot of peaches prior to shipment.

and a State department of agriculture or other State agency. The product is usually classified in accordance with U. S. standards. Inspectors issue certificates describing the quality, condition, grade, pack, and any other important factors relating to the various lots of fruit for which inspection is required or requested. Inspectors are not financially interested in the product, and are licensed by the United States Department of Agriculture. The certificates are receivable as prima facie evidence in all United States courts and most State courts (fig. 16).

ORIGINAL

Form FV-47 (Colorado)
Formerly OMS-47 (Colorado)

UNITED STATES DEPARTMENT OF AGRICULTURE
COLORADO DEPARTMENT OF AGRICULTURE, DIVISION OF MARKETS

236993

INSPECTION CERTIFICATE

This certificate is issued in compliance with the regulations of the Secretary of Agriculture governing the inspection of various products pursuant to the act making appropriations for the United States Department of Agriculture and the Statutes of the State of Colorado, and is admissible as prima facie evidence in all courts of the United States and Colorado. This certificate does not excuse failure to comply with any of the regulatory laws enforced by the United States Department of Agriculture or the Federal Food and Drug Administration.

Inspection point Palisade Kind Refrigerator Car Initials A R T
and number 18267

Inspection begun 11:45 a.m. August 22, 1950 Completed 1:15 p.m. August 22, 1950
(Hour, date) (Hour, date)

Applicant Peaches, Incorporated Address Palisade Colorado

Shipper same Address same Colorado

I, the undersigned, on the date above specified made personal inspection of samples of the lot of products herein described, and do hereby certify that the quality and/or condition, at the said time and on said date, pertaining to such products, as shown by said samples, were as stated below.

Condition of car: Hatch covers closed, plugs in, ice 1 foot from top of bunkers

Products: Brushed Elberta PEACHES in bushel baskets, branded SUPERIOR. Lids stamped with growers' numbers, minimum size, grade and variety. Manifested as 396 baskets.

Loading: Through load, 6 rows, end to end offset, 3 layers.

Pack: Mostly tight, many fairly tight Ring faced.

Size: 396 baskets. 2-1/4 inch minimum. Undersize within tolerance.

Quality and condition:
Mostly hard, many firm, generally well formed, clean, ground color light green to yellow, mostly turning yellow; from tinge to 30% mostly 5% to 25% characteristic red color. No decay. Grade defects average within tolerances.

Grade: U. S. No. 1 2-1/4 inch minimum

Fee \$8.00
Expenses _____
Total \$8.00

John Doe
John Doe Inspector

PLEASE REFER TO THIS CERTIFICATE BY NUMBER

FIGURE 16.—A Federal-State inspection certificate.

PMA 19414

Standardized grades, properly and consistently used, promote honesty and fair dealing and discourage careless and unscrupulous shippers. They enable the conscientious grower and shipper to realize a premium for care, honesty, and good judgment. They provide a common language with which to describe quality, maturity, size, condition, and other factors that affect the value of a given shipment. They serve as a convenient, fair, and understandable basis for inspection at shipping points and in receiving markets, for price quotations, for sales, for cooperative pooling, for financing, and for the reporting and intelligent comparison of market prices. The grade requirements of the U. S. standards have the same interpretation wherever they may be used throughout the United States. Since a premium price is generally received for the higher grades as compared with lower grades or ungraded fruit, the use of U. S. standards or of standardized State grades encourages better production methods among growers, and reduces loss and waste by preventing shipment of inferior fruit.

SHIPMENT

Most of the peaches produced in areas near or reasonably near large consuming markets are shipped by motortruck. Shippers in New Jersey, New York, Michigan, Maryland, Ohio, West Virginia, and North Carolina utilize trucking service for a large percentage of their shipments. It is estimated that shipments from Virginia, Texas, Arkansas, and South Carolina are about equally divided between rail and truck transportation. Shippers in Georgia, Utah, Colorado, Idaho, Washington, Oregon, and California use rail shipment for most of the peaches sent to far distant markets, although many refrigerated trucks are now in service on long-distance hauls (fig. 17). Shippers who favor shipment by truck claim they receive faster service to final destinations at less cost than by rail. Many shippers are convinced that direct packing house pickup and direct delivery at receiving point eliminate considerable bruising by reducing the number of times the packages are handled.

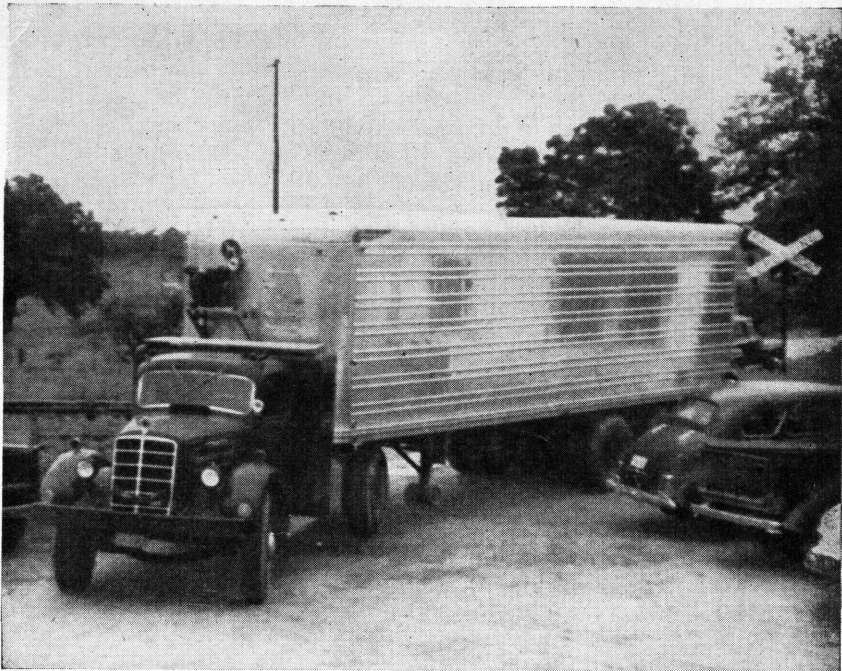
Many other shippers favor rail shipment for long hauls because they believe temperatures can be better controlled in refrigerator cars than in trucks. They also feel that some so-called refrigerator trucks do not maintain sufficient refrigeration throughout the transit period.

Whether or not trucking service may prove equal to or better than refrigerator car service for long-distance transportation of peaches, it is true that motortruck shipments have greatly widened distribution to small markets by less-than-carlot delivery. And truck shipment to nearby markets of peaches that closely approach a tree-ripened stage of maturity has become a common and desirable practice.

LOADING FOR SHIPMENT

Because of many differences in types and sizes of trucks, loading methods vary greatly. Drivers or other employees of the truck owners load the shipments by methods which experience has proved most practical, and truck operators are held responsible for safe delivery.

Proper loading of refrigerator cars is particularly important. The packages should be arranged so that efficient refrigeration may be



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FIGURE 17.—A refrigerated truck waiting to load at a packing house.

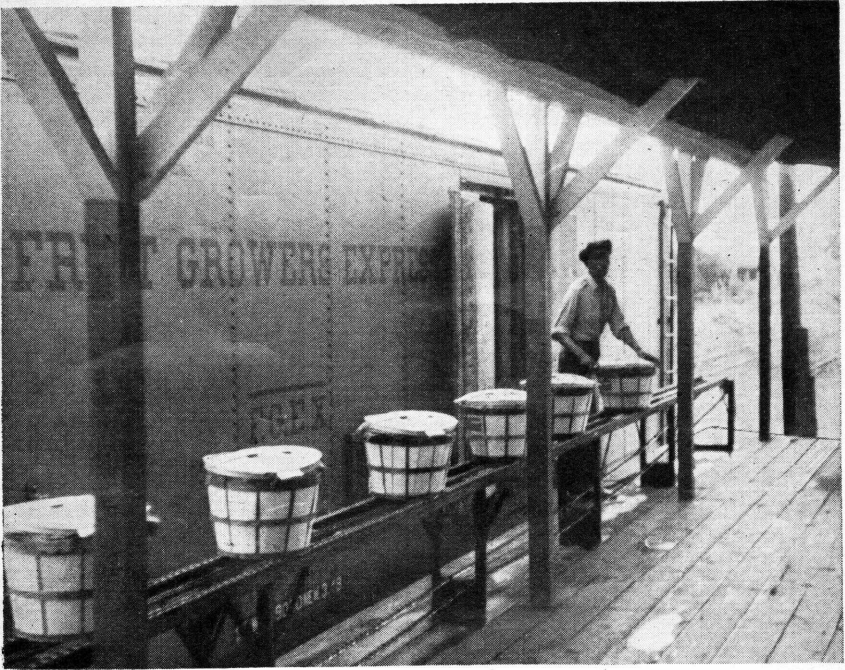
maintained by means of air circulation through the load. The loading should also be such that there will be no shifting in transit and that the weight of the upper layers of the stacked packages will cause the least possible damage to the fruit in the lower layers.

Cars should be iced 12 hours or more before loading, and the doors should be kept closed. Fruit should be loaded as soon as possible after packing, and should be protected from the sun during any waiting period (fig. 18). If facilities and time permit, precooling the fruit will promote lower temperatures in transit.

From 2 percent to 5 percent salt is frequently added to the bunker ice in refrigerator cars as an aid in precooling the load or to obtain colder carrying temperatures than those possible from ice alone. Such temperatures are often desirable for fruit which is at a relatively advanced stage of maturity in relation to the transit time involved. However, the addition of salt to bunker ice should be made with extreme caution, to avoid freezing injury to the fruit.

Bushel baskets are probably most frequently loaded 396 per car, in a through load 6 rows wide, end to end offset, 22 baskets in each row, 3 layers high. Loads with 387 or 378 baskets per car are also common. Utah and Idaho shippers usually load bushel baskets 4 layers high, with a total of 516 or 528 baskets. In all loads, baskets are placed so that in layers above the first, each basket rests on the covers of two baskets in the layer below.

The method of loading $\frac{1}{2}$ -bushel baskets is similar to that of loading bushel baskets, and 770, 800, or 806 are commonly loaded per car (fig. 19). Sometimes cars are loaded with alternate baskets inverted.



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FIGURE 18.—Packed baskets moving directly from the packing operation to the refrigerator car.



PMA 19417

FIGURE 19.—Partial load of $\frac{1}{2}$ -bushel baskets in a refrigerator car.

This is considered poor practice by most shippers, as it may interfere with proper air circulation through the load, and may cause additional bruising of the fruit.

Western boxes are generally loaded with 1,260 to 1,680 per car. All loads are center-braced, and the usual loading is 7 rows, evenly spaced, boxes lengthwise, 18 to 21 stacks, 9 to 12 layers. Although many shippers do not strip each layer, the practice of securing each layer with stripping to prevent any possible shifting of boxes is strongly recommended. Some California shippers use a crosswise loading method with vertical corner bracing to eliminate shifting. This loading method is commonly used for lug packs. It also is frequently used for western boxes (fig. 20), although transportation studies have shown that tight crosswise loads of western boxes do not cool as readily as lengthwise loads.

One type of center bracing commonly used consists of seven uprights against each face of the load (one upright against each row of boxes), with two of these reaching to the car ceiling. Two stringers are placed across each set of uprights, and braces between the two upper and the two lower stringers are used to secure the bracing gates. Bracing material is commonly of 2- by 4-inch dimensions.



PMA 19418

FIGURE 20.—Western boxes being loaded in a refrigerator car with the longest dimension of the boxes crosswise in the car. Note the vertical corner bracing.

STORAGE

Peaches cannot be held for long periods in cold storage. Occasionally, when market conditions appear to warrant, peaches are held in storage for short periods, but it has been found inadvisable to leave them in storage for more than 2 to 4 weeks.

SELLING METHODS

Varying sales methods are utilized in the different producing areas and within any one area. These depend upon such factors as who controls the marketing of the crop, prevailing market prices, and the size and quality of the crop.

Peaches produced by growers' association members are sold by association officials or sales agents. Independent growers who have financed their own operation, or who have acquired financing through agencies other than dealers or shippers, usually try to sell for cash to local buyers or to buyers representing receiving market dealers. Dealers and shippers who have made advances for growing and harvesting the crop ordinarily market it and charge a commission or a specified amount per package for the service. Large grower-shippers often handle the marketing of crops produced by other growers. Growers in some producing districts located within a few hundred miles of large markets may sell at least part of their crop directly to merchant truckmen who haul to the market and endeavor to resell at a profit.

In seasons when demand and quality are good, most of the carlot sales by shippers to receivers in the city markets are on a cash f. o. b. shipping point basis. When crops are large and supplies very plentiful, considerable quantities may be sold while en route to markets or consigned to commission firms. Peaches are usually sold on the basis of U. S. or State grades in the most important shipping districts.

TREND TOWARD NEW VARIETIES

For many years, the Elberta has been the principal variety produced in all important peach-growing areas. It is a yellow-fleshed freestone peach of attractive appearance which carries well for long-distance shipment, and grows and yields well under various climatic and soil conditions. Halehaven, J. H. Hale, Hiley, Golden Jubilee, and several other varieties are produced in considerable quantities, but the total volume of all of these together is relatively small in comparison with that of Elberta.

Undoubtedly the peach-growing industry should be much more diversified and able to choose from many first-rate varieties, having different ripening seasons, different tolerances to climate, and different quality factors to meet special requirements. Varietal needs for various climates are particularly important. In Northern States, both tree and flower bud must be resistant to low winter temperatures. Hardiness to spring frosts is necessary in central and southern areas, whereas in far western areas trees must have low winter chilling requirements. The work that has been done in variety breeding during the past 15 years by the United States Department of Agriculture, by many State experiment stations, and by various individuals, has developed several excellent new varieties which meet specific seasonal, climatic, or marketing needs. The fact that some of these newer varieties have been planted in considerable volume is an indication of a steadily increasing trend toward the needed varietal diversification.³

³ For more detailed information regarding recently developed varieties, see "Better Peaches are Coming" by Leon Havis, J. H. Weinberger, and C. O. Hesse. The Yearbook of Agriculture, p. 304, U. S. D. A. 1943-47.

